THIS IS YOUR ORDER NUMBER:

6992

PLEASE REFER TO IT IN ALL CORRESPONDENCE TO ENSURE FASTER SERVICE.

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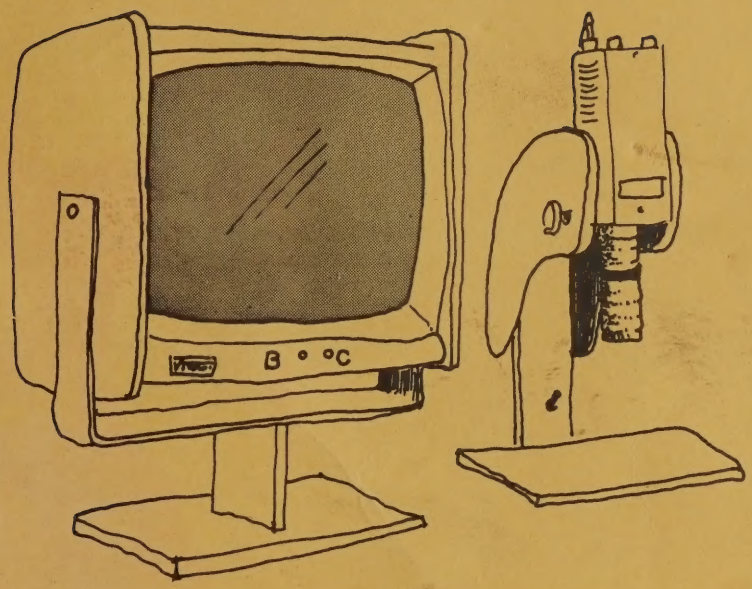

RS USER'S MANUAL

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VISUALTEK

NOTICE TO OUR CUSTOMERS

Periodically model designations may be changed due to our continuing effort to update our Read/Write systems. Therefore, recent internal modification has advanced the RS-6 to RS-8.

If you are presently using an RS-8 system, please be assured that this manual has been designed to give you full understanding of the equipment.

Thank you

All Visualtek equipment is subject to continuous development and improvement. Consequently, your Read/Write System may incorporate minor changes in detail from the information contained in this manual. Major changes affecting function or operation, which have been incorporated in the equipment since this manual was last printed, however, are described in detail through revision inserts.

Every effort has been taken to make the information in this manual as complete and useful as possible. Please review it carefully. Should you have any suggestions for further improvement, or additional information which you think should be included in this manual, we would be pleased to hear your comments.

Last Revised: March, 1977

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Printed November, 1974

Section 1

INTRODUCTION

WELCOME...to the world of reading and writing with a Visualtek Read/Write System! The experiences of many satisfied users across the nation and around the world make it highly likely that you, too, will now be able to markedly improve your enjoyment of a good novel, or your ability to do your homework or office paperwork without assistance; to read your daily newspaper or weekly news magazine, even the smallest print such as stock market quotations, or your personal correspondence; to write your own checks or personal letters, or make notes in the margin of a book or magazine; and many other useful and enjoyable tasks.

This USER'S MANUAL is designed to help you in "getting started" on what should be a lifelong experience of continuing benefit. The various sections of this manual deal with unpacking and setup, instructions for effective use of the equipment (including helpful hints gained from the experience of others), and a variety of other useful information.

We'd like to hear from you...about your experiences with the Visualtek Read/Write System, about any interesting or novel uses you've found for the equipment, about any "short cuts" you've developed for yourself to make reading and writing easier, or with any suggestions or comments you might have about the equipment itself, or this manual. Simply write to:

Visualtek
Customer Relations Manager
1610 26th Street
Santa Monica, Ca. 90404

One other note: in order to provide effective service to our users, it's essential that we know the name and address of the actual user, or the responsible teacher or supervisor in the case of a school or agency. Therefore, please return the WARRANTY VERIFICATION CARD enclosed with your equipment as soon as possible...if the card is missing, simply send us the appropriate name and address on a piece of paper.

NOMENCLATURE

In reading through this manual to learn how to most effectively use and benefit from your Visualtek Read/Write System, it will be helpful to familiarize yourself with the nomenclature used by Visualtek for the various major parts of the Camera System.

BASE	The main base on which all other parts are supported directly or indirectly; felt-bottomed to protect furniture, but still allows easy sliding for better positioning of the entire unit.
VIEWING TABLE	The smaller movable surface, attached to the base through two pair of orthogonal slides.
SUPERSTRUCTURE	The main top assembly, with gracefully curved side panels, hinged to an upright post attached to the rear of the base. The superstructure includes a knob on either side, a recessed handle, the camera, and the zoom lens (attached to the camera).
CAMERA	The closed-circuit television camera which is the "heart" of the Visualtek Read/Write System.
ZOOM LENS	The cylindrical black or silver lens screwed into the camera. Nomenclature for various parts of the zoom lens is described in the section of this manual dealing with controls and adjustments.
MONITOR	The television screen on which the enlarged high-contrast image appears. It looks much like a home TV screen in appearance, but cannot receive "broadcast TV channels".

Section 2

UNPACKING

Camera System

UNPACKING AND ASSEMBLY

The Camera System is completely assembled when shipped, except for the lens. All that it is necessary to do is to open the shipping carton, remove the packing materials included inside the carton, and lift out the Camera System.

Place the Camera System on a desk or table, and follow these instructions to prepare it for use:

1. Screw lens into the camera.

2. Loosen the knob on the right-hand side of the Camera Support Assembly. The entire Camera Support Assembly will now pivot lightly and easily about its rear hinge point. Raise it about 7-8" and tighten in position with the right-hand knob.

3. Loosen the knob on the left-hand side of the Camera Support Assembly and swing the camera itself (with lens attached) up into a vertical position, then tighten the left-hand knob.

4. Uncoil the power cord and plug into any convenient grounded ac receptacle.

5. Loosen the right-side knob on the Camera Support Assembly and readjust height so that the bottom of the lens is approximately 6" from the viewing table. This is a good 'starting point'...for information on the effect of changing this distance, refer to Section 7.

6. Tilt the light shade forward.

Note: should it ever be necessary to reship the entire unit to Visualtek, special packing instructions are available, and will be provided on request. Save all packing materials.

Monitor

ASSEMBLY

Two types of TV Monitors are available from Visualtek. Those without a stand are designed to sit on a desk or tabletop. No assembly is required after this type of TV Monitor has been removed from its shipping carton.

An optional stand is available for use with most Visualtek monitors. The stand, which may also be ordered for later installation in the field, is available in two models, depending on the type of monitor you have.

Model ST-3 Monitor Stand is used with Visualtek's Model RS-3 Read/Write Systems (17" monitor), while the Model ST-5 Monitor Stand is used with Visualtek's Model RS-5 Read/Write Systems (19" monitor).

Model ST-3 Monitor Stand

1. Remove three thumbnuts from the teardrop-shaped baseboard, place the chromed steel upright post over the triangular fitting on the baseboard, and fasten it in place with the three thumbnuts. Tools are not necessary....hand-tightening is adequate.

2. Hold the monitor by the handle on top, and use your other hand to slide the square collar (with large black knob sticking out of it) over the upright post; be sure that the monitor lies over the baseboard. Lower about halfway down the post, and tighten the large black knob. The height may be readjusted at any time.

Model ST-5 Monitor Stand

1. The vertical support (3" square post) is available in two heights. The shorter height (approximately 5") is the standard for normal usage. For usage with Visualtek's Typewriter Accessory, the longer height (approximately 10") provides some additional benefits in allowing better clearance for a typewriter carriage, and hence allowing the screen to be positioned closer to the user. However, the added height may be disadvantageous for some users. The extended post is available at no charge upon request.

2. Attach the U-bracket to the top of the vertical support post, with the "U" pointing up, using the four screws provided.

3. Place the monitor on a table, or on the floor, and place the stand around it so that the base is in front of the screen. Attach the U-bracket to either side of the monitor using the hand knobs provided, but do not tighten down firmly.

4. Lift the monitor up slowly. The monitor stand will simply swing into place underneath the monitor. Place the stand/monitor assembly on the table you will be using, next to the camera system. The side hand-knobs may be tightened as desired to establish the monitor tilt angle.

For any monitor

Plug the power cord (from the monitor) into the outlet at the back of the square upright post at the back of the camera system. This allows the master switch on the camera system to control all the equipment used.
NOTE: if the monitor has its own on/off switch (present on some models, but not all), turn it "on" and leave it on . . . it is not necessary to use this power switch on the monitor on a continuing basis.

INTERCONNECTION (Camera System to Monitor)

Connect the signal cable, from the back/bottom of the camera stand, to the matching video connector at the rear of the monitor (some models may have two such connectors . . . use either one, there is no difference). If there is a small switch near these connectors, then:

(a) If labeled, set it to the "75" or "TERMINATED" position;

(b) If unlabeled, on the Visualtek M-19 monitor, set it to the "down" position.

Some models of Visualtek's RS series systems do not include this termination switch on the M-19 monitor.

VERTICAL/HORIZONTAL ADJUSTMENTS

Under certain conditions, primarily component aging over extended periods of time, a monitor can develop "horizontal instability" or "vertical instability", similar to what can happen on a regular TV receiver. Hence, all monitors include "horizontal hold" and "vertical hold" adjustments for use when necessary. These are front-panel controls on some models, but are located on the back panel (because of infrequent usage and a desire to minimize unnecessary front-panel "clutter") on RS Systems with 19" monitor. On the RS monitor, there are four recessed controls (screwdriver adjust) on the back panel, at the bottom center, below the black switch/connector panel. From left to right, there four controls are: CONTRAST (same as front panel); BRIGHTNESS (same as front panel); VERTICAL HOLD; HORIZONTAL HOLD.

It is also possible that Vertical Hold and/or Horizontal Hold may require adjustment following repair or replacement of the camera or portions thereof.

Section 3

INSTRUCTIONS for USE

Your Visualtek Read/Write System is easy to set up, easy to use, and will give you years of trouble-free operation. There are a number of aspects of its use and operation with which you should become familiar, as explained in this section. With a little practice and some actual usage, adjustment and use of the system will become second nature to you. The unit should first be set up, as described in section 2. Then read through this entire Section 3 and follow the steps outlined.

ELECTRICAL RECEPTACLES

The Camera System includes three electrical receptacles, all controlled by the master on/off switch on the front of the rear upright post. Although their intended use is described elsewhere in this manual, in connection with various options or other features, here is a summary of the use of these various receptacles.

REAR OF UPRIGHT POST	Use for plugging in monitor.
UPPER-FRONT OF UPRIGHT POST (two receptacles)	One of these receptacles is used to plug in the power cord from the camera (which is threaded through the superstructure, and hence partially concealed under normal conditions). The other receptacle is used for the regular viewing table light with 3" diameter shade. When the Typewriter Accessory is being used, the regular viewing table light should be unplugged from this receptacle, and the Typewriter Accessory cord should be plugged in here instead.

SWITCHES ON THE CAMERA

On the under-surface of the camera, near the zoom lens, are 1, 2, or 3 toggle switches, depending on the various options which may be installed on your Camera System. The left-hand switch controls image polarity (positive or negative images), and its use is described under ADJUSTMENTS (later in this chapter). The two switches on the right-hand side are used in conjunction with the Typewriter Accessory and the Forward Viewing Option. Their usage is described in the sections dealing with those features, and is pictured in Figure 3-3.

ZOOM LENS

The various adjustments on the zoom lens are described later in this chapter. If you observe the zoom lens, you will note a narrow ring about 2" from the camera. This is called the aperture ring, and it controls the amount of light which enters the camera.

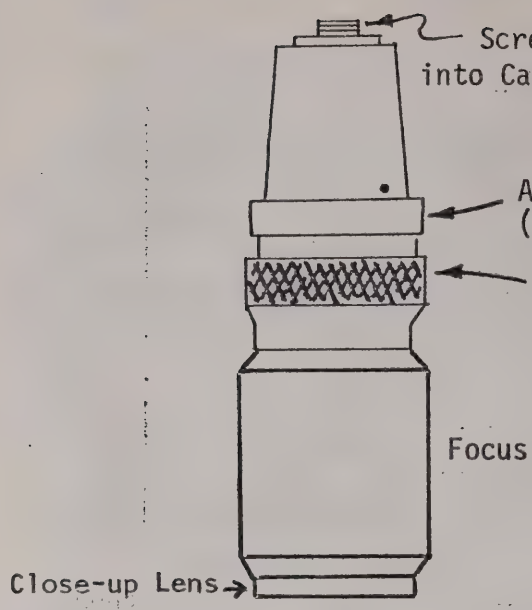

Figure 3-1

Note: Appearance of zoom lens may vary slightly on some models, but relative position of the control rings remains unchanged.

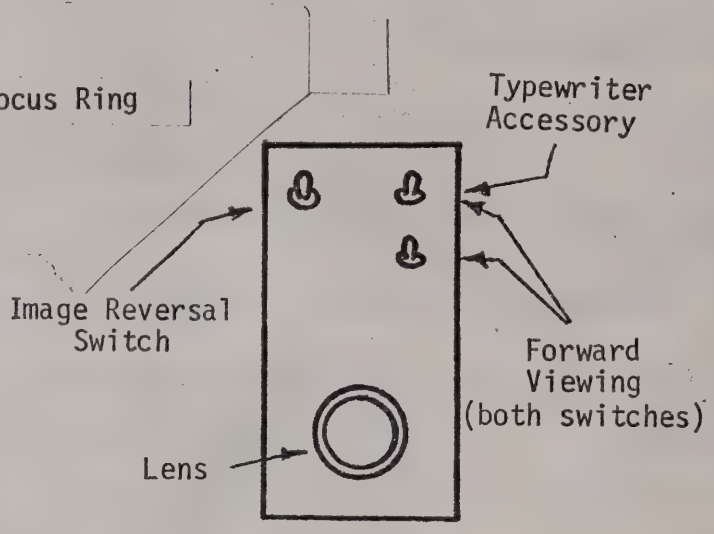

Figure 3-3

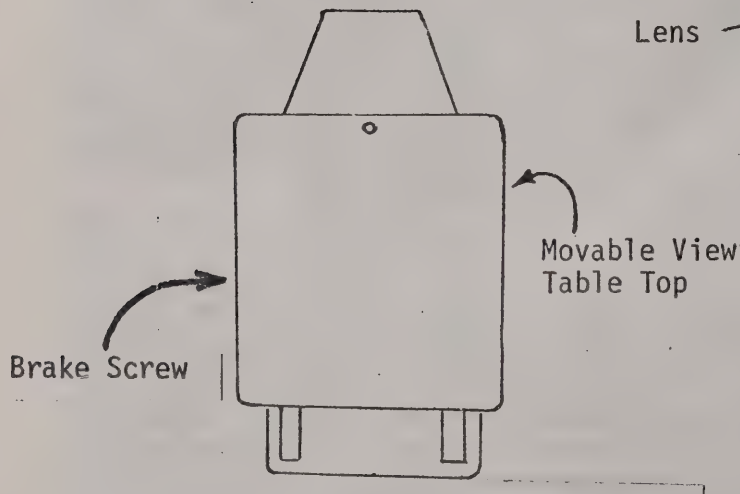

Figure 3-2

Figure 3-3b: Another Style Camera

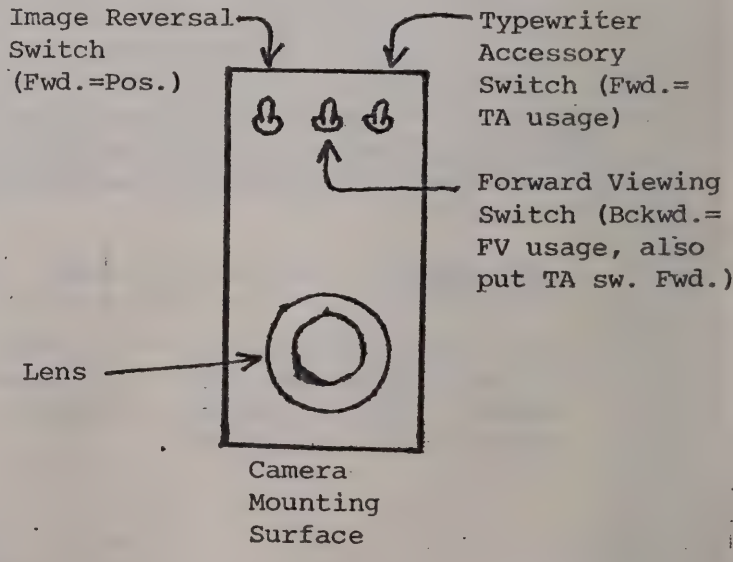
Image Reversal Switch (Fwd.=Pos.)
Typewriter Accessory Switch (Fwd.= TA usage)
Forward Viewing Switch (Bckwd.= FV usage, also put TA sw. Fwd.)
Lens
Camera Mounting Surface

ON/OFF

A master on/off switch is located on the rectangular upright post which supports the superstructure, at the rear of the base. This switch faces the user. It controls three receptacles: two above the switch on the front of this same post, and one on the back side of the post. Usage of these receptacles is explained at appropriate points throughout this manual.

MAGNIFICATION

Magnification, or size, is controlled by another ring on the zoom lens (see Figure 3-1). If other adjustments are made properly, the image should remain sharp and in focus over the full magnification adjustment range. See information (P.3-4) under SUPERSTRUCTURE HEIGHT regarding changing the magnification range.

FOCUS

The bottom ring on the zoom lens (see Figure 3-1) is used for properly focusing the image.

The image can be refocused quickly and conveniently when required, which includes the following situations: any major change in the thickness of material being read; any change in the superstructure height; or when using the Typewriter Accessory.

Focusing should be done with MAGNIFICATION set to maximum size; then turn the magnification ring down to the desired level. This procedure ensures that the image will remain in focus over the entire range of adjustment of the magnification ring.

APERTURE

The aperture adjustment controls the amount of light passing through the lens into the camera, and as a result, has a significant effect on image intensity. Visualtek zoom lenses have "detents" in the aperture adjustment, which can be "felt" as the aperture ring is turned . . . if your hearing is very good, you may even be able to hear a "click" at each of these detent positions.

The aperture ring has five positions. Hence, if the aperture ring is turned as far as it can go in either direction, then turned the other way, four distinct detents can be felt until the other extreme position is reached. The optimum adjustment position is generally the middle position, that is, two detents from either extreme position. Some variation may be desirable to materials which are especially shiny or reflective, or when using the Room Viewer option. Remember that too much light passing through the lens can produce undesirable image quality as readily as too little light.

IMAGE POLARITY

Underneath the camera, near the zoom lens, there are 1, 2, or 3 toggle switches; the number of switches depends on the particular options which may be installed on your Camera System. The left-hand switch (see Figure 3-3) controls image polarity; positive or negative. In one position, positive images (black letters on a white background) will be displayed. In the other

position, negative images (white letters on a black background) will be displayed. Negative images are often substantially easier for extended periods of reading because they minimize background glare and provide sharper letter quality.

The remaining two switches are related to use of the Forward Viewing Option and the Typewriter Accessory. Their usage is explained in the sections of this manual dealing with those features.

GHTNESS
CONTRAST

All Visualtek monitors provide contrast and brightness controls. On Visualtek 19" monitors (part of Model RS-5 systems), contrast is the right-hand knob, and brightness is the left-hand knob (these controls are unlabeled on this monitor). These controls play a significant role in the quality of the image produced, and should be checked whenever any significant change is made in aperture setting or image polarity. With all Visualtek monitors, best results are obtained by turning the contrast control as far as possible without causing the image (letters) to 'break up' or begin to 'flow'. Then, the brightness control alone may be used for subsequent adjustments.

ERSTRUCTURE
GHT

A knob on the right-hand side of the superstructure (see Figure 1-1) controls its positioning. To reposition the superstructure, simply loosen this knob and move the counter balanced structure to the desired new position, then re-tighten the knob. The main purpose of this adjustment is to allow changing the magnification range. For example, suppose that the superstructure is set at such a height that the magnification adjustment on the zoom lens provides a magnification range from x5 to x25. Lowering the entire superstructure will increase the magnification range, for example, to x6 to x30 (depending on the point to which it is lowered). Therefore, to increase the magnification range, raise the superstructure. It is necessary to refocus each time the superstructure position is changed.

The superstructure height is also adjusted when the Typewriter Accessory or Forward Viewing Option is being used. This is described in the sections of this manual dealing with those features.

For easy portability, the superstructure is lowered as far as possible, after first folding up the camera and the light shade. Refer to the section of this manual which describes PORTABILITY.

ERA ANGLE

A knob on the left-hand side of the superstructure permits the camera and lens to be positioned at any angle from vertical to approximately 10 degrees below horizontal (resting against internal superstructure support). To change camera angle,

simply loosen the left-hand knob on the superstructure, tilt the camera to the desired angle with your other hand, and retighten this left-hand knob. The camera will ordinarily be vertical for normal reading and writing, but is set at different positions for portability, use with the Typewriter Accessory, and forward viewing. Sections of this manual dealing with these features describe in detail how these different adjustments of camera position should be made.

VIEWING TABLE BRAKE

The amount of friction in the vertical direction (towards and away from you) of viewing table travel is controlled by a thumbscrew on the left-hand side of the base. Move the table to the right to reach this thumbscrew easily. It can be tightened as much or as little as you desire, including to a 'fully locked' position. When in this fully locked position, the table cannot be moved in and out. As the thumbscrew is tightened, the back and forth motion of the viewing table becomes progressively "stiffer". This feature helps maintain smooth motion while reading a line of print, without allowing the viewing table to "skid" off the line being read. The particular brake setting is a matter for individual preference and selection. There is no brake or other impediment to smooth motion of the viewing table in the side to side direction, except as described next.

VIEWING TABLE LOCK

For use with the Typewriter Accessory, or for travel, the viewing table should be locked in both directions. Lock the table in the vertical direction as described above. To lock the table in the horizontal direction (side to side), bring the two margin stops together in the center and tighten.

Viewing Table

The viewing table surface is 14" wide by 14" deep. The table moves freely for 11" side to side, and 11" back and forth. Underneath the table, on the left slide, there is a friction brake which deliberately provides for "sluggish" motion in the back and forth direction, so that moving material from line to line (under the camera) is easier.

Should you wish to obtain a larger reading surface, Visualtek's Model VT-6 Detachable Table may be ordered. This separate piece fits over the regular viewing table in a matter of seconds, and provides a 20" wide by 15" deep work surface. Table travel dimensions are unchanged.

Reading

Place the material to be read on the viewing table (centered). If a single sheet of paper is to be read, it may be clamped at the back edge using the inexpensive metal clamps available at most stationery stores.

Most users find that reading is most effective using the reversed image (white-on-black). Contrast and brightness controls should be adjusted for maximum black background. It may sometimes be desirable to slightly close the aperture by turning this control clockwise (left side away from you).

It is sometimes helpful to turn off all room illumination, and close shades or blinds, because this helps to increase screen contrast.

Set the zoom lens for maximum magnification and focus carefully, using the ring near the bottom of the lens. Then lower the magnification gradually until the magnification is at the lowest possible level which still allows you to read in comfort.

IF RIGHT-HANDED: (If left-handed "reverse" the following directions.)

Place your right hand on the table, near the front edge. If the material being read will not lay flat, place your hand over the material, a few inches below the point where you expect to begin reading. Slide the entire table from side to side with your right hand to read across each line; avoid moving the material on the table. As you finish a line, move the entire table back to the right, staying approximately on the same line. When the left margin of the material being read is again under the camera, push the table back slightly, bringing another line into the center of the screen. With practice and familiarity, you will be able to perform these two motions simultaneously.

To locate a particular area on a page, or determine if there are more paragraphs or columns you want to read, use your left hand to lower the zoom lens magnification until you can see a large portion of the page. Move your right hand so that a finger points to the approximate area you wish to read. Then, as your left hand increases magnification back up to a suitable level for reading, your right hand can be moving the table (and the material) so that it is aligned properly under the camera based on the portion of the page you wish to read.

READING BOOKS

To read books most effectively with the Visualtek Read/Write System, a number of techniques can be used. This section describes some ways in which you can help yourself to read thick books more easily and more quickly using the Visualtek Read/Write System.

THE "PROBLEM" OF CURVATURE OF THE BOOK

If a book is simply opened up for reading, it will appear as shown in figure 3-4 (edge view). Notice that the pages curve in varying degrees; the amount of curvature will depend on the type of binding and a number of other factors.

Since it may sometimes be difficult to use the Read/Write System for reading a page which is curved in this way, some method must be used to flatten the page you're reading.

There are at least two ways to accomplish this conveniently. One is to simply place your hand on the book (on the page you're reading), generally just below or just above the area you're reading, and hold the page flat in this manner. The second way is to use a sheet of plexiglass...we recommend 9"x12"x1/8" thick as a good size for many purposes. The weight of this sheet of plexiglass will hold many pages flat without any further pressure, although sometimes it may be useful to also press down with your hand on top of th plexiglass, as you're reading. See figure 3-5 for an illustration of how the plexiglass would appear.

Depending on the binding of the book, and how thick it is, one other technique may also be useful. Keep a small stack of pieces of cardboard handy (about postcard size, or larger). Place an appropriate quantity of these pieces of cardboard, or any other convenient "spacing" material, under the side of the book with fewer pages (depending on what page you're reading on), so as to raise it up slightly. This will cause both the left and right pages which are open (see figure 3-6) to be approximately level, and will more readily allow the sheet of plexiglass (described above) to be placed across both pages at once.

THICKNESS

As you know from reading the other instructions we have provided for use of the Read/Write System, it is necessary to compensate for the thickness of reading materials, including books, by using the exclusive zoom adjustment (bottom ring on the zoom lens). Generally, you should first get the book pages you are reading approximately flat, perhaps holding them with one hand, and then use your other hand to make the focusing adjustment.

Writing

Place the material to be written on upon the viewing table (centered). As for reading, a clamp may be used to more firmly affix the writing material to the viewing table.

Most users find that writing is easier using the normal image (black-on-white). Also, most users find that writing is easiest when magnification is only about two-thirds as much as they customarily use for reading. Other general hints given for reading, such as contrast and brightness adjustment, turning off room illumination, etc., are also applicable for writing.

IF RIGHT-HANDED: (If left-handed "reverse" the following directions.)

Place your left hand on the material, slightly above the area where you expect to be writing. Move the point of your writing implement (pencil, pen, felt market, etc.) slightly above the paper until you see it on the TV screen. Lower the point to the paper and begin writing...there's no way to get wet except to dive into the water! Writing effectively is not difficult, but does require a certain amount of practice. The commonest problems encountered are difficulty in dotting i's and crossing t's, staying on a straight line, and moving the writing implement from the end of one line to the beginning of the next, after moving the viewing table back to the right and "up" one line. Invariably, however, 30 minutes practice (or less) will allow you to write clearly and concisely. After a few days, you will undoubtedly find writing with the Visualtek Read/Write System to be second nature to you.

Figure 3-4

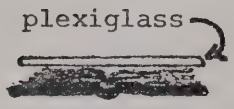

Figure 3-5

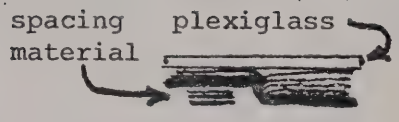

Figure 3-6

SPECIAL TIPS FOR FOCUSING

As previously mentioned, it is best to focus the image at the maximum magnification setting, which ensures that the image will remain in focus at all smaller magnifications. Best focus must be determined visually, by looking for sharp, clear, and non-blurry letter outlines.

Here's a suggestion which may help you focus the image more easily and effectively: pick a letter which has a centered circle in it (such as "p", "o", "b", etc.). Then, adjust the focus control on the lens to make the center circle as large as possible...if you turn the focus control to far in either direction, from the correct position, the center of the letter will tend to get smaller.

SECTION 4

USE WITH MICROVIEWER OR RS-7

Your Visualtek Read/Write System can also be used with a Visualtek Microviewer, to allow reading most standard microfiche and some other microform materials. Depending on the specific configuration involved, your present Read/Write System may have an additional video signal connector on the top of the camera (labeled VIDEO IN), and perhaps some additional switches and connectors which are not specifically referenced in this manual, and for which no connecting cables are provided. These additional connectors and switches, if present, are included to facilitate later expansion of your system to meet other needs. If and when you obtain such additional equipment, separate manuals provided with it will describe proper interconnections and usage.

Your Visualtek Read/Write System can also be used with Visualtek's special Typing Aid System, which provides a more powerful and more flexible typewriting capability than is available with the Model TA-3 Typewriter Accessory described in this manual, primarily for those whose daily job requirements include a large amount of typing and proofreading.

For additional information on either of these added capabilities, please contact your local Visualtek representative, or the Visualtek home office in California.

Section 5

TYPEWRITER ACCESSORY

FORWARD VIEWING

MARGIN STOPS

TYPEWRITER ACCESSORY

The Visualtek Model TA-3 Typewriter Accessory fastens to the camera mounting plate in back of the zoom lens, and allows the Camera System to be used with a typewriter, adding machine, or other similar office equipment. To use the Typewriter Accessory, the following steps must be followed:

1. Place the typewriter accessory behind the botton of the zoom lens, so that the two locating pins on the typewriter accessory fit into the corresponding holes on the camera mounting plate extension.

2. Lock the typewriter accessory in place by tightening the thumbscrews on both sides of the camera mounting plate extension.

3. Lock the movable viewing table in place, using the table locking screw provided. There are a number of different positions in which the table may be locked. By trial and error, select the best one for your particular typewriter.

4. Raise the superstructure out of the way, and tilt the lightshade back out of the way. Unplug the regular viewing table light from the receptacle at the upper front surface of the rear vertical post. Plug the cord from the Typewriter Accessory into this now-vacant receptacle.

5. Place your typewriter on the viewing table.

6. Tilt the camera back at about a 25 degree angle from vertical. Lower the entire superstructure so that the bottom of the Typewriter Accessory lies just above your typewriter (but not touching it).

7. Toggle the right-front switch on the bottom of the camera. This allows the camera to view the typewriter platen through a mirror mounted in the typewriter accessory.

8. Focusing is accomplished with the bottom element on the zoom lens.

9. In order to obtain a clear image, it may be necessary to make minor adjustments of superstructure height, camera angle, and typewriter position.

The Typewriter Accessory includes its own illumination, to maximize image quality. However, because the area being viewed on a Typewriter often has many small mechanical parts, unusual shadows or image effects will sometimes be observed. These are normal, and are to be expected. Because of the structure of the typewriter, some users prefer positive images (black on white) when using a typewriter, even though they normally prefer negative images (white on black) for regular reading. Try both ways and see which suits you best.

FORWARD VIEWING

One of the truly significant advances embodied in the Visualtek Camera System is the Forward Viewing Option, which allows the unit to be used for viewing remote information (generally 8-50' away) such as a blackboard, bulletin board, easel, or objects or individuals across a room. While the Forward Viewing feature does have certain limitations, as described below, it can generally be used with success by most users if they view the image (monitor or TV screen) from a closer distance than is normally necessary for them. This sometimes may be as close as 2-3" from the screen, depending on the user's particular viewing capability.

To utilize the Forward Viewing feature, the following must first be done:

1. Using the left-hand knob on the superstructure, tilt the camera to approximately a horizontal position. It can be repositioned as required, after following the steps below, to "aim" directly at what is being viewed.

2. Unscrew the bottom "element" on the zoom lens, which is a close-up lens. This "element" is about 1/4" thick. There may be two of these lenses on some systems. To unscrew it, grasp the barrel of the zoom lens in one hand (to avoid unscrewing the entire zoom lens from the camera), and turn the bottom ring(s) on the zoom lens.

3. Set both switches on the right-hand side of the bottom surface of the camera to the opposite position (from their "normal" settings). This has the effect of turning the image upside down, which is required for forward viewing. An incorrect setting of these switches will yield either an upside-down image or a mirror image.

4. Set the aperture control to admit the maximum possible amount of light; this is at its extreme counterclockwise position, and will normally be required under conditions of normal room illumination.

5. Set the image polarity switch (right hand side of bottom surface of camera) to produce positive images. Generally, because of poor and uncontrolled illumination of a remote area being viewed, negative images will generally be very non-uniform, although they may be employed at the discretion of the user, but with reduced contrast.

6. Generally, the user will want to set it on one side of a table or desk which is about 2 1/2' wide, with the monitor or TV facing him, and the camera pointing away from him (at the remote item being viewed). If the Camera System can be positioned to one side of the user, this will generally result in easier access to the adjustments on the lens.

Focusing is accomplished with the focusing ring, which is at the "bottom" of the zoom lens (the end farthest away from the camera itself). "Rough focusing" should first be made with magnification set at the lowest possible level. Then, as magnification is increased, the focus may be further 'tuned' as required. Note that the minimum distance at which forward viewing will function effectively is about 8", and maximum magnification is substantially lower than is directly attainable for reading materials on the viewing table. However, compensation can be obtained by viewing the screen from a much closer distance...as close as 2-3" if you find this necessary. Most users will find it possible to read, for instance, material written on a blackboard from 8-50' away, or even ordinary printed matter at short distances.

MARGIN STOPS

The Margin Stop feature is designed to limit the travel of the movable viewing table in the side to side (left to right and vice versa) direction. This feature is particularly useful when reading narrow columns such as in a news magazine or newspaper.

Two small thumbscrews at the front edge of the movable viewing table control left and right stops respectively, much as on most typewriters. Simply loosen either or both stops, reposition as desired, and tighten firmly. It is sometimes helpful to first position the table at the desired "stop position" on one side, then position the corresponding stop by sliding until it "hits" the tab on the table. Then repeat this procedure on the other side, if desired.

ELECTRONIC LINE MARKER

The Visualtek Model VK-3 Electronic Line Marker, available with both RS-Series Systems and the Miniviewer, is a useful and valuable accessory which controls the amount of information displayed on the screen by "blanking out" unneeded portions. It consists of additional electronic circuitry, plus two external control knobs. On RS-Series Systems, these control knobs are located on the top surface of the camera (when in normal reading position), at the front edge. On the Miniviewer, these control knobs are located on the Upper Control Panel, above the Image Reversal and Forward Viewing switches respectively.

The Electronic Line Marker allows you to "blank out" (make black) horizontal areas at the top of the screen, or the bottom of the screen, or both. Hence, only the horizontal center portion of the screen (the "line") is displayed...the remainder of the screen is blanked out, both above and below the area you define through adjustment of these two knobs.

The right-hand knob controls "starting position" for the horizontal area (line) which you wish to view. At the maximum counterclockwise position, the "starting position" is effectively off the screen at the top, and cannot be seen. As the knob is turned clockwise, the starting position begins to move down the screen.

The left-hand knob controls "ending position" of the horizontal area (line) which you wish to view, and hence effectively controls the size of the blanked-out area at the bottom of the screen. At the maximum counterclockwise position, the visible horizontal area (line) is at its minimum size (about 1" typically). As this knob is turned clockwise, the width of the visible horizontal area increase.

There are four "modes of operation" which can easily be obtained.

(1) No blanking at all ("normal", as if the Electronic Line Marker were not installed): turn right knob full CCW, and left knob full CW.

(2) Normal usage with defined visible horizontal area (line): turn right knob to desired starting position, and left knob to define desired width of line. Then, with line height defined, move right knob to vary position up and down the screen.

(3) Underlining: set right knob to full CCW, then use left knob to blank out only the desired amount at bottom of screen (underneath desired line).

(4) Overlining: set left knob full CW, then use right knob to blank out only the desired amount at top of screen (over desired line).

Please note that some readjustment of brightness and contrast controls may be desirable, to produce more effective images, depending on the specific width of visible area which is selected.

Section 6

PORTABILITY

The Visualtek Camera System is designed to be readily portable, from room to room in your home, or even from your home to office and vice versa, in an extremely easy manner. All that is necessary is to do the following:

1. Loosen the left-hand knob on the superstructure, and tilt the camera back to rest inside the superstructure...do not tighten this left-hand knob yet.

2. Disconnect the monitor signal cable.

3. Unplug your monitor or TV from the rear receptacle on the upright post.

4. Unplug the Camera System power cord from the wall, wrap it around the bottom of the upright post for convenience, and plug it into the now-vacant receptacle on the back of the upright post.

5. Lock the viewing table.

6. Loosen the right-hand knob and lower the superstructure to the viewing table, then tighten the right-hand knob to the greatest extent possible.

7. Ensure that the camera is down as far as possible, and tighten the left-hand knob to hold it in place.

8. Reach behind the camera, and lift the recessed handle. Now, simply "walk away" with the Camera System.

Section 7

MAGNIFICATION

The actual magnification gained is based on a number of factors, as listed below. In each case, the effect (of the factor) is also described.

ZOOM LENS — The Visualtek zoom lenses, as described in more detail in Section 3, provides a 4 to 1 or 5 to 1 range of dynamic magnification, depending on specific model. This means that the ratio of minimum to maximum magnification provided by using the magnification ring on the zoom lens is four or five. If the unit were set up, for example, so that the minimum magnification were x6, then the maximum possible magnification (using the magnification ring only) would be x30, with the 5:1 zoom lens.

WORKING DISTANCE — Magnification is also based on how far the bottom of the zoom lens is from the surface of the material being read. The range of focus adjustment (of the zoom lens) allows the working distance to be in the range of approximately 3 1/2" to 13". Visualtek recommends that the distance between the bottom of the lens and the viewing table (with nothing on it) be initially set at about 6". This allows materials up to 2 1/2" thick to be read with ease. If thicker materials than this are to be read regularly, or if smaller magnifications are desired, raise the entire superstructure. If larger magnifications are desired, lower the entire superstructure. However, note that this will corresponsingly reduce the available working distance.

SCREEN SIZE — The physical size of the display screen (TV or monitor) also is a factor in establishing magnification. For instance, the maximum magnification which can be obtained on an 18" diagonal screen is twice as large as the maximum magnification which can be obtained on a 9" diagonal screen, for any specific combination of zoom lens and working distance.

MAGNIFICATION — The actual magnification which can be obtained with any combination of equipment can range as high as x60. For instance, with a 17" screen, the maximum magnification could be as high as x48. The optimum magnification, or magnification range, is based on the needs of each particular user. A previous paragraph (WORKING DISTANCE) described the flexibility inherent in a Visualtek Read/Write System, which allows variation of the magnification range in a matter of seconds. Should you find that the maximum magnification available with your equipment is not completely adequate to meet all your needs, please contact Visualtek to learn about alternative equipment which is available to meet this requirement.

A separate sheet, #M021, is available from Visualtek, which provides a means of determining (measuring) the actual approximate magnification at any particular lens setting, for any combination of working distance and screen size. Copies are available on request.

LIMITED WARRANTY STATEMENT

VISUALTEK VIDEO VISUAL AIDS ARE GUARANTEED BY VISUALTEK, FOR A PERIOD OF ONE YEAR FROM DATE OF SHIPMENT TO THE ORIGINAL PURCHASER, TO BE FREE FROM DEFECTS IN MATERIAL OR WORKMANSHIP. THIS WARRANTY EXCLUDES FUSES, BULBS, AND SIMILIAR REPLACEABLE ITEMS, AND DOES NOT COVER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

THIS WARRANTY IS A "FACTORY WARRANTY," AND DEFECTIVE ITEMS MUST BE RETURNED TO VISUALTEK'S FACTORY, OR TO THE NEAREST AUTHORIZED VISUALTEK SERVICE CENTER, FOR REPAIR WITH TRANSPORTATION CHARGES PREPAID BY THE USER. HOWEVER, USERS ARE ENCOURAGED TO CONTACT VISUALTEK BY MAIL OR PAID PHONE CALL PRIOR TO RETURNING EQUIPMENT FOR REPAIR, SINCE MANY APPARENT DEFECTS MAY BE SOLELY THE RESULT OF IMPROPER ADJUSTMENT OF THE EQUIPMENT, IN WHICH CASE REPAIRS OR READJUSTMENT MAY BE ACCOMPLISHED WITHOUT RETURN TO THE FACTORY.

ITEMS RETURNED FOR REPAIR MUST BE PACKED SECURELY, AND SHOULD BE INSURED BY THE USER AGAINST DAMAGE IN TRANSIT. VISUALTEK DOES NOT ASSUME RESPONSIBILITY FOR DAMAGE OCCURING IN TRANSIT UNLESS EQUIPMENT IS PACKED SECURELY AND PROPERLY AND IS RETURNED IN ITS ORIGINAL PACKING MATERIALS (EXTRA SETS OF THESE MATERIALS ARE AVAILABLE UPON REQUEST.)

NO MODIFICATION TO, OR EXTENSION OF, THIS WARRANTY MAY BE MADE EXCEPT IN WRITING BY A DULY AUTHORIZED OFFICER OF VISUALTEK. THIS WARRANTY MAY BE VOIDED IF EQUIPMENT IS ALTERED OR REPAIRED OTHER THAN BY VISUALTEK, OR BY PERSONS AUTHORIZED OR CERTIFIED BY VISUALTEK TO MAKE SUCH ALTERATIONS OR REPAIRS. THIS WARRANTY APPLIES ONLY FOR USAGE OF VISUALTEK EQUIPMENT FOR THE PURPOSES DEFINED IN VISUALTEK LITERATURE.

Section 8

WARRANTY

MAINTENANCE

WARRANTY

Your Visualtek Read/Write System is guaranteed to be free from defects in material or workmanship for a period of one year from date of shipment. The warranty does not include light bulbs, fuses, or any other similar replaceable items. The warranty does include all electronic items, such as the camera and all its parts, and the monitor, and also includes the lenses, mechanical parts, etc. Cosmetic damage such as nicks or scratches is not covered unless present when the equipment is initially received, and Visualtek is notified within ten days.

The user's responsibilities are as follows, if a defect or malfunction occurs which is believed to be covered under warranty:

1. Notify Visualtek, by mail or phone, of the "problem" you have encountered. Please describe the "symptoms" you observe as completely and clearly as possible. If you are phoning, you should do so from a phone near the equipment, since the Visualtek Service Manager may wish to ask you some questions about what you observe on the equipment while you are talking.

2. In some cases, Visualtek's Service Department will send out a replacement part, or even an entire unit, to promptly rectify the problem. As soon as you receive the replacement part and verify that the problem is solved, the defective item should be promptly returned to Visualtek. If the original shipping container is unavailable, any corrugated carton of adequate size may be used. However, any parts should be well-padded, using wadded-up newspapers or some other cushioning materials.

3. In some cases, Visualtek's Service Department may request that the defective item be returned to Visualtek for repair. The same procedures should be followed as described above, regarding packing.

4. Shipping and insurance charges to return defective parts to Visualtek are the responsibility of the user. In order to minimize delays and ensure the promptest possible service to you, Visualtek suggests the following methods of shipment:

   (a) From California, Washington, Oregon, Idaho, Nevada, and Arizona: use United Parcel Service (UPS), truck shipment.

   (b) From other states: use UPS Blue Label Air Service, when available. If UPS does not serve your area, use REA Air Express.

   (c) Insure the return shipment as instructed by Visualtek's Service Department.

   Shipping and insurance charges to deliver replacement parts to you are paid by Visualtek, under the warranty.

No modification to or extension of this warranty may be made except in writing by a duly authorized officer of Visualtek. This warranty may be voided if equipment is altered or repaired other than by Visualtek or persons authorized by Visualtek to make such alterations or repairs.

DISCONNECTION OF CAMERA

Should it ever be necessary to return the camera to Visualtek for repair, or for the addition of any options, the following steps whould be followed, in the indicated sequence.

1. Unplug the camera (underneath the superstructure, at the front-top of the upright post which supports the superstructure).

2. Carefully pull the camera power cord up through the superstructure and the camera hinge point, so that it hangs loose.

3. Disconnect the "signal cable", by unscrewing, from the top of the camera.

4. Unscrew the lens from the camera.

5. Unscrew the camera from the back (two screws).

6. Place a piece of masking tape over the lens opening in the camera, to protect it from dust and debris.

7. When packing the camera for shipment, use a strong carton at least 1" larger than the camera on all sides, and pack securely using wadded-up newspapers or other suitable padding materials.

8. When temporarily storing the zoom lens, while the camera is being repaired, it is suggested that a piece of masking tape be placed over the small end, to protect the lens from dust or other debris.

To reconnect the camera, simply perform the above steps in reverse sequence.

AFTER THE WARRANTY EXPIRES

After the one-year warranty period has expired, Visualtek has available a Warranty Extension Agreement, which is effectively an equipment maintenance contract which renews the warranty for successive years, at a modest cost. You will automatically be notified, shortly before the end of the one-year warranty period, about the availability and price of this Warranty Extension Agreement, so that you can decide if this is the best way for you to ensure that your Read/Write System remains in "tip-top condition".

MAINTENANCE

The Visualtek Read/Write System is a remarkably trouble-free device, which should give you many years of trouble-free benefits. A certain amount of preventative care will help ensure your complete satisfaction. If a problem does occur, it may be due to improper adjustment of the operating controls, or to some other reason which can readily be fixed in a few moments without requiring Visualtek service. To assist you in handling these situations, the following sections provide the following information:

LIGHT BULB: what type to use, how to change it.

PREVENTATIVE MAINTENANCE: things you should check or do periodically to ensure continued satisfaction with the equipment.

TROUBLE-SHOOTING GUIDE: some "symptoms" which may occur, and what you should do about them before calling Visualtek for service assistance.

LIGHT BULB REPLACEMENT

The recommended bulb type is 30R20. This is a 30 watt 110 volt bulb in a miniature reflector shape. If the bulb burns out and one of these recommended bulbs in not immediately available, any small bulb (maximum wattage: 50) may be used temporarily, but the illumination provided will not be as good as with the recommended bulb type.

To change the bulb, turn power off and be sure the lamp has cooled. Place your fingers on the large outer surface of the bulb, which lies just barely inside the 3" circular shade, and turn counterclockwise to remove. The bulb will drop out into your hand after it has been unscrewed sufficiently far. Replace the bulb by reversing this procedure.

PREVENTATIVE MAINTENANCE

Because the Visualtek Read/Write System is so reliable, and constructed of high-quality components, very little preventative maintenance is required. However, the following suggestions will help keep your equipment functioning well for many, many years.

1. As required, clean the base and viewing table top, and painted surfaces, with any non-abrasive cleaner suitable for this purpose (check the label on the cleaner).

2. Every six months, move the viewing table as far as it will go in each of four directions (left, right, back, forward) and clean the exposed inner portions of the slides with a clean lint-free cloth. Then apply a small quantity of a light grease (petroleum jelly, such as Vaseline, is quite suitable for this purpose) to the inner sides of the slides.

3. At least once a month, or more often if required to maintain high image quality, lightly clean both ends of the zoom lens with a soft tissue of the type available for cleaning eyeglasses or photographic lenses.

4. The glass face of the monitor should be lightly dusted with a clean lint-free rag at least once each week. Do not use any detergent or cleaner. However, a slightly moist rag may be used first if there are any persistent dirty or dusty spots, followed immediately by another dry, clean rag.

For those customers who wish to perform their own maintenance and repair, and are technically qualified to service video equipment, Visualtek provides a series of Service Bulletins which include circuit schematics and various other information useful in performing such service. Request a copy of Bulletin M065, which lists all such Service Bulletins, and select the ones required for your particular configuration of equipment. Alternatively, state the model designations for your equipment and request Visualtek to provide copies of all applicable Service Bulletins.

TROUBLE-SHOOTING GUIDE

This section is designed to assist the user in determining the source of any problems which may develop, in part because many such "problems" may simply be caused by improper adjustment, and also to ensure that when you need to call on Visualtek for service assistance, the promptest and best possible service can be provided. This section presents "symptoms", and each "symptom" is followed by a list of one or more actions which can be taken to try to rectify the "problem" or identify its source.

Symptom	Suggested Action
Viewing table light not on.	1. Is main power cord plugged into wall outlet? 2. Is the master on/off switch (near base of post) in the "on" position? 3. Is lamp cord plugged into an electrical receptacle (near top of post). 4. Check fuse (if present on your model) in electric receptacle box (near base of post). 5. Remove light bulb and test it in another fixture...replace if necessary.
White monitor screen, but no image.	1. Check signal cable between camera and monitor...are all connections tight? 2. Check RF/VIDEO connection on top of camera...connect to VIDEO for use with monitor, or RF for use with TV set. 3. Check focusing of camera and lens. 4. Is camera plugged into an electrical receptacle (near base of post). 5. Try camera with a different monitor or regular TV set, to determine whether camera or monitor is at fault. 6. Is lens cap removed? 7. Are all cable connections properly made (camera to monitor)?
Dark monitor screen.	1. Is monitor plugged in and power turned on? If so, small amber lamp on monitor front panel should be lit. 2. Turn brightness and contrast controls on monitor front panel... it should be possible to obtain a white screen, at least, as described in previous symptom. 3. Check RF/VIDEO connection on top of camera...set to VIDEO for use with monitor, or RF for use with TV set.
Image present, but "washed out" (poor contrast).	1. Check lightshade, rotate by hand if necessary to ensure good illumination on center of viewing table. 2. Check aperture adjustment on zoom lens (see section 3 of this manual), set to "8" (f/8).

3. Adjust contrast and brightness controls on monitor to improve quality (see section 3 of this manual).

4. Use reading material of highest possible quality (sharp black letters on white or yellow background) to ensure that image is not simply a reflection of poor quality in reading material.

5. Check switch in back of monitor, with two positions labeled 75 and HI-Z. Set this switch to 75 position.

Image present, but "fuzzy".

1. Repeat focusing procedure, referring to Section 3 of this manual for complete instructions.

2. Recheck aperture setting.

Black band horizontally across center of screen.

1. This condition is caused by low voltage power from your wall outlet. This in turn may be caused by a power company "brown-out", especially in major population areas during the summer. It is a temporary phenomenon, and should not occur frequently. Another cause may be equipment on the same electrical circuit which draws a lot of electrical current (for instance, an air conditioner, waffle iron, or power tools). Try another wall outlet which is not on the same electrical circuit, such as by running an extension cord to an outlet in another room.

Four corners of the picture "chopped off".

1. Some of the components inside the monitor have been shaken from their normal setting. Contact the Visualtek Service Department.

"Spots" or "dirt" on the screen.

1. Clean the monitor face and both ends of the lens, as previously described under PREVENTATIVE MAINTENANCE.

2. If symptom still present, remove the lens. Looking up into the camera, a silvered surface approximately 1/2" in diameter can be seen.

   Obtain a combination brush/squeeze-blower from a photographic supply shop. Use this inexpensive cleaning device to blow up into this opening, to dislodge any dust or debris which may be there. Use the brush end to "sweep" the silvered surface gently, if necessary.

3. If the dust or debris is still present, moisten a Q-tip or equivalent clean lint-free cotton swab in clean rubbing alcohol, and gently swab this silvered surface. When complete, replace lens without allowing dirt or other debris to enter the lens opening in the camera. The same cleaning procedure can be used on both ends of the zoom lens.

4. If you have been using the Forward Viewing option, there may also be dust or debris on the two lens surfaces which are disconnected when using this feature. The same lens cleaning procedure can be used by unscrewing the variable close-up lens, and cleaning both of its surfaces as well as the now-exposed surface on the end of the zoom lens (at the end of the auxiliary focus ring).

Monitor image "rolls" from top to bottom or bottom to top	1. Turn monitor at an angle, so you can reach back-panel controls while looking at screen. 2. Locate VERTICAL HOLD control (second screwdriver adjustment from right). 3. Use a screwdriver to turn this control slowly while you watch the screen. If rolling becomes faster, turn in opposite direction. Continue to turn until image on screen slows and stabilizes vertically. 4. Check correctness of adjustment by turning system off, then on again, several times. Readjust as necessary until image remains stable vertically.
Image "breaks up" into diagonal or horizontal flickering bands which are unevenly light and dark	1. Turn monitor at an angle, so you can reach back-panel controls while looking at screen. 2. Locate HORIZONTAL HOLD control (screwdriver adjustment at right of panel). 3. Use a screwdriver to turn this control slowly while you watch the screen. If image uncorrected when control turned fully in one direction, turn in opposite direction. Flickering will slow and image return to normal when adjustment is complete. 4. Check stability by turning system on and off several times, readjusting if necessary.

Section 9
OPTIONS
ACCESSORIES
SUPPLIES

A variety of options and accessories are available for use with your Visualtek Read/Write System. You may have some of them already, but if not, here's a "shopping list".

Model VT-6, Supplementary Viewing Table (20" wide by 15" deep).
Slips over top of regular viewing table to provide large work surface. Self-aligning, lock screw to hold in place.

Model TA-3, Typewriter Accessory.
Allows the Camera System to be used with most standard typewriters, or an adding machine or similar office equipment.

Model FV-3, Forward Viewing Option.
Allows Camera System to be used for viewing blackboard, easel, etc. Requires factory change to camera.

Model VK-3, Electronic Line Marker.
Built-in feature, factory-installed only, which allows user-controlled blanking of top and bottom of the screen, leaving an unblanked readable area in roughly the center. Minimizes excess glare for those with extreme light sensitivity, and aids reading.

Plexiglass sheet (1/8" x 9" x 12").

Spare Light Bulb (30R20, frosted)

Current prices for any of the above items will be supplied on request.

Additional options and accessories may also be available to meet specific needs. If there is something you would like to do with your Visualtek, but can't, let Visualtek know . . . perhaps we can help, by proposing a solution to your problem!

EQUIPMENT RETURN NOTICE

DATE:

THIS FORM MUST ACCOMPANY ALL EQUIPMENT RETURNED FOR SERVICE. IF A SEPARATE LETTER HAS BEEN SENT REGARDING THIS EQUIPMENT, PLEASE BE SURE THAT A COPY OF THAT LETTER ALSO IS ATTACHED TO THIS FORM!

DESCRIBE EQUIPMENT (INCLUDE SERIAL NUMBER FOR CAMERA OR MONITOR):

USER (FULL NAME/ADDRESS/PHONE): #1

BEING RETURNED BY (INCLUDE PHONE): #2

ORIGINAL VISUALTEK ORDER NO. (IF KNOWN)

AFTER REPAIR, RESHIP TO:
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IS SERVICE ( ) NON-BILLABLE (WARRANTY, OR UNDER SERVICE AGREEMENT)
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IF BILLABLE: YOU MUST TELL US IN THE SPACE BELOW WHO WILL BE RESPONSIBLE FOR PAYMENT, WHETHER OR NOT WE ARE TO PROVIDE AN ESTIMATE BEFORE DOING ANY WORK, AND WHETHER OR NOT ANY SPECIAL BILLING FORMS MUST BE USED.

DESCRIBE NATURE OF PROBLEM OR DAMAGE AS COMPLETELY AS POSSIBLE. PLEASE TYPE OR PRINT LEGIBLY. USE ADDITIONAL SHEETS OF PAPER IF NECESSARY.

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Would you like to tell friends or associates about Visualtek? Just list their names and addresses on the back of this sheet, your name and address on the postpaid reply, cut as indicated, fold, staple and mail. (We'll pay the postage.)

And, if you have any comments or questions, please feel free to use the space below or on the reverse side - we'll reply promptly.

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